COUNTY of BLAIR

DEPARTMENT OF EMERGENCY SERVICES

911 CENTER & EMERGENCY MANAGEMENT AGENCY

DEPARTMENT OF EMERGENCY SERVICES:

www.blaircounty911.com

Mark Taylor Director 911 911 Administrative Phone: (814) 940-5900 EMA Administrative Phone: (814) 940-5901 Administrative Office Fax: (814) 940-5907

Dan BoylesDirector EMA

615 Fourth Street, Altoona, PA 16602

COUNTY COMMISSIONERS:
Terry Tomassetti
President
Diane L. Meling
Vice President
Donna D. Gority
Secretary
Helen P. Schmitt
Chief Clerk
Nathan W. Karn, Sr.

December 28, 2011

Federal Communications Commission 445 12th St., S.W. Washington, D.C. 20554

RE: Waiver of the Narrowbanding Deadline Section 1.925

Blair County 911 615 4th Street

Altoona, PA 16602

FRN 0005377411

Blair County is respectfully asking for a Waiver of the January 1, 2013 Narrowbanding Deadline. The deadline requested is June 30, 2013. The County is in the process of upgrading its current system from analog to P25 Digital Simulcast.

The County has recently secured the funds through a bond to cover the expenditures of the new system. The application for frequencies at the sites was submitted to APCO in November. Blair County is planning on using frequencies licensed currently throughout the county by adding them to all the sites. Some of the subscriber units have already been purchased and are narrowband P25 digital capable. The remaining entities as well as the County are currently securing funding through grants and bonds for the subscriber base.

The new system will entail 7 sites along with Base Units at the EOC. The attachment called Narrowbanding Presentation contains photos of the county's current sites and equipment. A small portion of the equipment is capable of Narrowbanding (but is older and difficult to find parts for repair); however, none of the equipment is capable of P25 digital simulcast. Therefore, all the equipment needs to be replaced.

The attachment marked Blair County Equipment layout shows the infrastructure needed for the new system. There is also microwave to be installed at all 8 locations along with tower construction and replacing and providing new building structures for the equipment to be housed.

The system will encompass all of the Emergency Services (Fire, EMS and LAW) in the county. Since the frequencies that were requested are already in use in the county by Emergency Services, there should be minimal co-channel or adjacent channel interference.

All the subscriber units will be reprogrammed prior to the cutover of each of the services. This will allow for any problems to be resolved before the actual cutover takes place to avoid lack of communication during an emergency 911 call.

Attached is a timeline depicting the expected completion dates of the phases of the project. Items 1, 2, 3, 4, 5, and 7 have been completed. There is one lease that needs finalized for item 6. Items 8, 9, and 11 have been started. We are currently on time with the timeline proposed for a 2012 completion.

The main reasons Blair County 911 is asking for the waiver is for unforeseen setbacks. These include, but are not limited to: 1. severe weather conditions that can occur until late Spring 2012 or start in early Fall 2012 that can hinder travel to and from the remote tower sites causing a delay in tower construction and equipment installation and; 2. Availability of parts. Although the lead time for the towers, and equipment needed is currently within the allotted timeframe, unexpected acts of weather can hinder shipment of components needed to build the infrastructure.

Blair County is striving to meet the January 1, 2013 deadline for the Narrowbanding requirement. The June 30, 2013 extension is being requested to cover the unforeseen setbacks mentioned above.

Thanks you, in advance, for your consideration in this matter.

Respectfully,

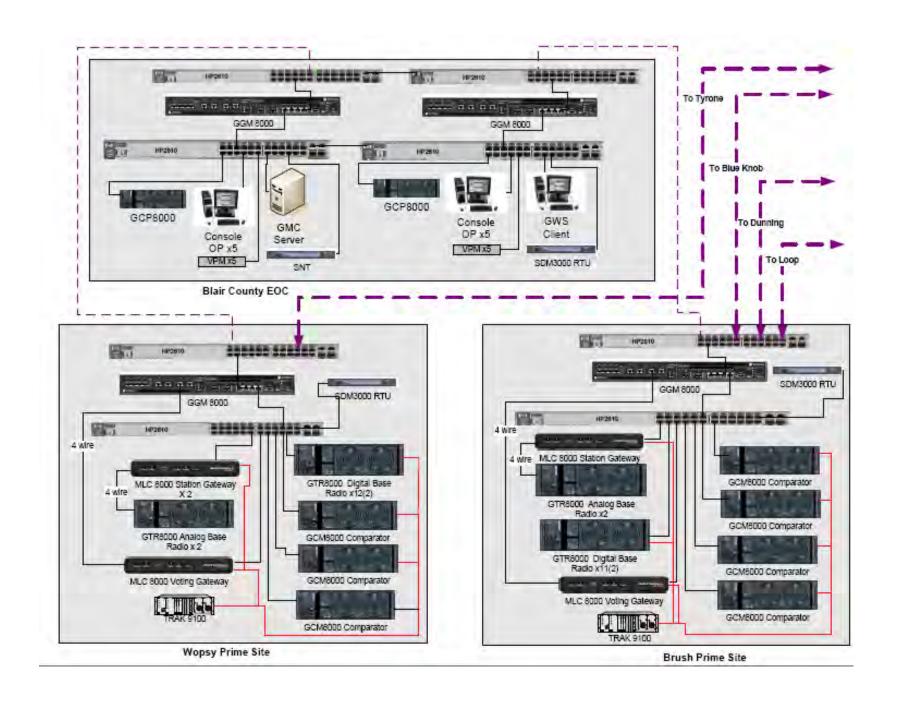
Mark Taylor

Blair County 911 Director

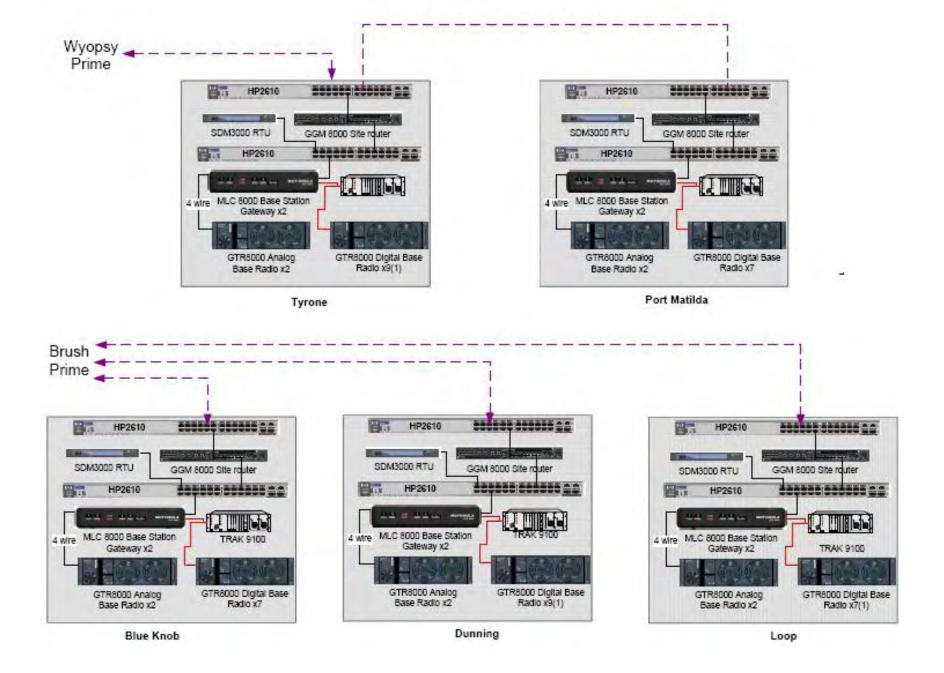
Time Line

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סו	Task Name	Start	Finish	Duration	2010 2017
1	STRUCTURE REVIEWSITE COVERAGE STUDY	12/6/2010	9/23/2011	210d	
2	EXISTING SITE VISIT OF INFRUSTRUCTURE /VISIT OF NEW CODE COMPLIANT SITE	6/1/2011	6/30/2011	22d	_
3	SUBSCRIBER INVENTORY REVIEW WITH PUBLIC SAFETY FOCUS GROUP	7/1/2011	8/25/2011	40d	
4	SYSTEM REVIEW OF NARROWBANDING COMPLIANCE AND P2S MIGRATION STRATEGY	8/1/2011	9/29/2011	44d	
5	PROJECT FUNDING/CONTRACT DOCUMENTATION	8/1/2011	11/18/2011	80d	
6	SITE FOUNDATION IMPROVMENTS BRUSH /DUNNING/REVIEW OF SITE LEASES	9/1/2011	10/31/2011	43d	
7	FINALIZE EQUIPMENT TO MEET NARROWBAND MANDATE	10/3/2011	10/28/2011	20d	
8	PROCESS EQUIPMENT LIST/START NARROWBAND PROJECT WITH SITE IMPROVEMENTS	11/3/2011	1/17/2012	54d	
9	SITE DEVELOPMENT/PROCURMENT OF COMBINERS /RADIO INFRUSTRUCTURE	11/15/2011	3/18/2013	350d	
10	COMBINER EQUIPMENT AND MICROWAVE INSTALLATION MANUFACTURING AND STAGING	2/2/2012	8/21/2012	1440	
11	DIGITAL RADIO EQUIPMENT/ COMBINER SYSTEM/MUX INTERFACE	12/20/2011	10/3/2012	207d	
12	DEPLOYMENT OF PAGING CHANNEL/PROGRAMMING SUBSCRIBERS/TEMPLATE DEVELOPMENT	8/17/2012	11/29/2012	75d	
13	INSTALL P25 SITE EQUIPMENT/ SUBSCRIBER RE-PROGRAMING	6/1/2012	12/14/2012	141d	
14	INTERFACE DIGITAL AND LEGACY EQUIPMENT	1/2/2012	11/16/2012	230d	
15	OPTIMIZE SYSTEM	10/15/2012	11/28/2012	33d	
16	RESOLVE PUNCHLIST / TRAINING	11/28/2012	12/14/2012	13d	
17	FINAL ACCEPTANCE	12/17/2012	1/8/2013	17d	
_					

Blair County Equipment Layout



Blair County Equipment Layout





FCC LICENSEE REQUIREMENTS

January 1, 2011

- New license applications must specify at least 12.5 kHz efficiency
- License modification applications to expand authorized service areas must specify at least 12.5 kHz efficiency

January 1, 2013

All licensees must operate in at least 12.5 kHz efficiency



FCC MANUFACTURER REQUIREMENTS



February 14, 1997

*Radio equipment certification submittals must include a 12.5 kHz efficiency mode – can be dual mode 25/12.5 kHz efficiency

January 1, 2011

Can no longer certify equipment capable of operating at 25 kHz efficiency

January 1, 2013

- **Can no longer manufacture, import or market equipment capable of operating** at 25 kHz efficiency – must disable via software
- *Radio equipment certification submittals must include a 6.25 kHz efficiency mode – can be dual mode 12.5/6.25 kHz efficiency



Page 2

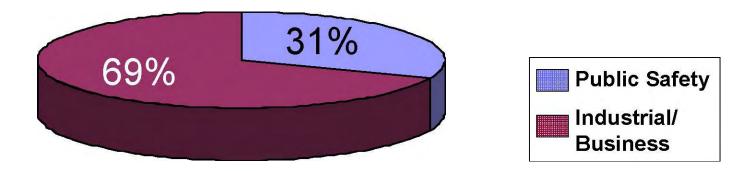
2011 LICENSEE ACTIVITY



Frequencies That Need to Go Narrowband

Blair County Has 15 UHF Frequency Pairs that Need to Go Narrowband Affecting Police, EMS, and Fire Services in the County

- All 34 Frequency Pairs are operating on 25kHz "Wideband"
- All Fire, Police, and EMS Public Safety Services Subscriber Units (including Pagers) Need Reprogrammed by December 2012



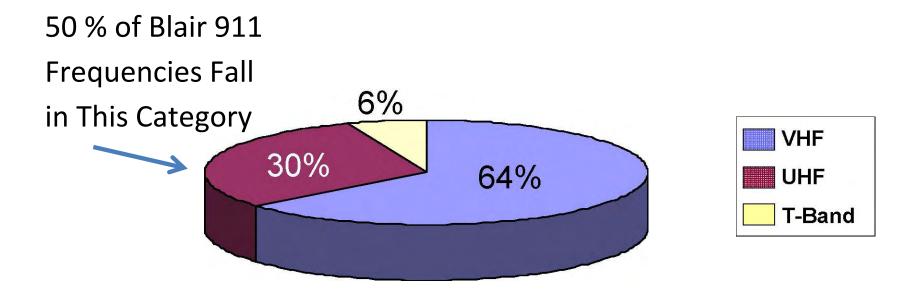
Band Split of Frequencies that Need to Go Narrowband



2011 LICENSEE ACTIVITY



Public Safety Frequencies



All of Blair County's 911 Channels Fall in the UHF Spectrum Band Split of Frequencies that Need to Go Narrowband



Blair County Freq. Data Sheet



	Name	License Holder	TX Freq	RX Freq	Call Sign	FRN#	NB=N WB=W	Expiration Date
1	North Police	Blair	465.0250	460.0250	WPKN664	000-5377411	N	May 15 2012
2	Metro Police	City of Altoona	465.4250	460.4250	KNGG920	00-10442051	W	May 19 2015
3	Metro Operations	City of Altoona	465.1500	460.1500	KNGG920	00-10442051	W	May 19 2015
4	Metro Mobile to Mobile	City of Altoona	460.2250	460.2250				
5	Central Police	Blair	465.0750	460.0750	WPKN664	000-5377411	N	May 15 2012
6	Central PD Ops	Logan Township	465.3250	460.3250	WNCH569	000-5377718	W	Dec 24 2011
7	Central PD Mobile to Mobile	Logan Township	460.1750	460.1750	WNCH569	000-5377718	W	Dec 24 2011
8	South PD	Blair	465.1250	460.1250	WPKN664	000-5377411	N	May 15 2012
9	South PD Operations	Roaring Spring PD	465.4000	460.4000	WNXR489	000-6507669	W	Oct 30 2011
10	Regional	Blair	465.2750	460.2750	WPKN664	000-5377411	N	May 15 2012
11	Blair County Sheriff	Blair	465.3000	460.3000	WPKN664	000-5377411	N	May 15 2012
12	Metro Fire	Blair	465.5750	460.5750	WPKN664	000-5377411	N	May 15 2012
13	Hazmat	Blair	465.6250	460.6250	WPKN664	000-5377411	N	May 15 2012
14	Blair Fire Dispatch	Blair	465.6000	460.6000	WPJK367	000-5377411	N	July 2 2011
15	North Fire Ops	Blair	465.1000	460.1000	WPKN664	000-5377411	N	May 15 2012
16	Central Fire Ops	Blair	465.5000	460.5000	WPKN664	000-5377411	N	May 15 2012
17	South Fire Ops	Blair	465.0500	460.0500	WPKN664	000-5377411	N	May 15 2012
18	South Fire Ops 3	Blair	458.3500	453.3500	WQNP377	000-5377411	N	Oct 4 2011
19	Spare Ops Channel	Blair	458.7250	453.7250	WQKE776	000-5377411	N	Oct 4 2011
20	West Fire Ops	Blair	458.9500	453.9500	WQHQ348	000-5377411	N	March 31 2008
21	East Fire Ops	Blair	458.9500	453.9500	WQHQ348	000-5377411	N	March 31 2008
22	North Fire TACH	Blair	460.1875	460.1875	WPKN664	000-5377411	N	May 15 2012
23	Central Fire TACH	Blair	460.2875	460.2875	WPKN664	000-5377411	N	May 15 2012
24	South Fire TACH	Blair	460.3875	460.3875	WPKN664	000-5377411	N	May 15 2012
25	Blair EMS DISP Med 10	Altoona Hospital	467.9750	462.9750	KXZ436	000-752580	W	Aug 26 2012
26	Blair Med 9	Altoona Hospital	467.9500	462.9500	KXZ436	000-752580	W	Aug 26 2012
27	Blair med 1	Altoona Hospital	468.0000	463.0000	KXZ436	000-752580	W	Aug 26 2012
28	Blair Med 2	Altoona Hospital	468.0250	463.0250	KXZ436	000-752580	W	Aug 26 2012
29	Blair Med 3	Altoona Hospital	468.0500	463.0500	KXZ436	000-752580	W	Aug 26 2012
30	Blair Med 4	Altoona Hospital	468.0750	463.0750	KXZ436	000-752580	W	Aug 26 2012
31	Blair Med 5	Altoona Hospital	468.1000	463.1000	KXZ436	000-752580	W	Aug 26 2012
32	Blair Med 6	Altoona Hospital	468.1250	463.1250	KXZ436	000-752580	W	Aug 26 2012
33	Blair Med 7	Altoona Hospital	468.1500	463.1500	KXZ436	000-752580	W	Aug 26 2012
34	Blair Med 8	Altoona Hospital	468.1750	463.1750	KXZ436	000-752580	W	Aug 26 2012



Transitional Problems



- Communications between WB & NB radios is possible, although at a reduced efficiency.
- Voice quality will be reduced, and data corruption will increase.
 - ❖ WB TX to NB RX = Potential distortion
 - ❖ NB TX to WB RX = Low recovered audio
- ❖ Potential for CTCSS and DCS coded squelch signaling to be unreliable between NB TX and WB RX.
- Radios and equipment must be upgraded expeditiously to insure minimal cutover time.



Will This Affect Interoperability?



- Mismatch between WB & NB radios is inevitable between interoperating agencies.
- Agencies may coordinate their narrowbanding cutover to insure minimal mismatch time.
- Check with your region's interoperability committee to see if plans have been put in to place for narrowbanding.



Range Problems With Narrowband



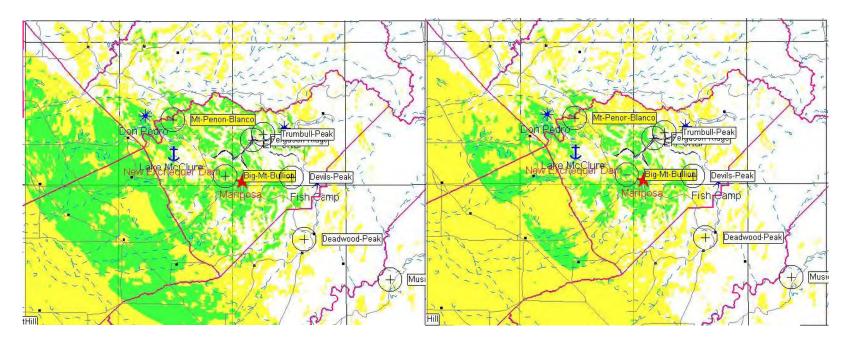
- Licensee can expect some loss of coverage due to lowered recoverable audio.
- Every system is unique, and should be carefully evaluated to determine the result
- Voters can help with talk back coverage
- Additional sites or increased ERP may be necessary to improve talk out coverage



Coverage Loss Example



Wideband Analog Reference Narrowband Analog
3Db Worse

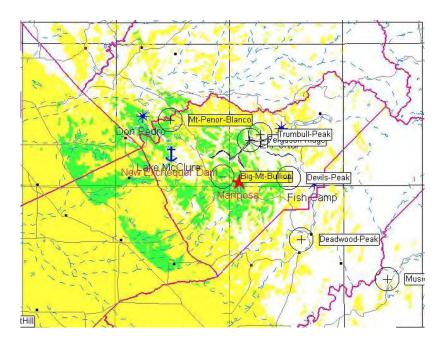




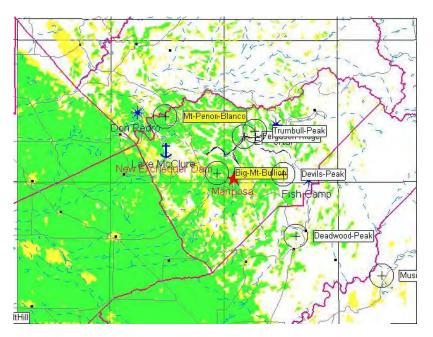
NB vs P25 Coverage Example



Narrowband Analog Reference



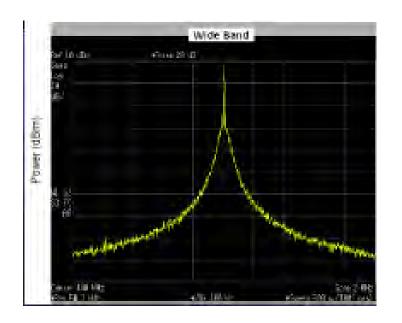
Narrowband Digital P25 8.9 dB Better

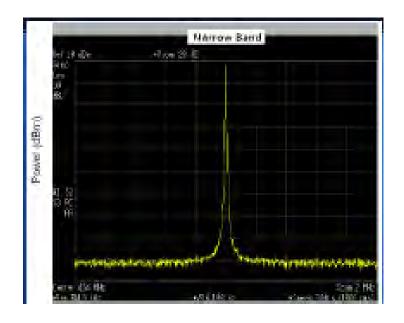






Getting Ready for Narrowband







Blair County Current System



- 5 site Analog UHF Radio System with 4 Simulcast Channels with 34 UHF Dispatch Channels
- Infrastructure was installed in 1996 and 2000 for main dispatch channels
- All Base and Simulcast Equipment Operates 24/7 365 days
- Tower Infrastructure from Mid 1970's to the 1990's
- Dunning and Williamsburg were developed in the Mid 1990's with "Used" Towers



Blair County Current System Cont'd



- Towers will no longer Support New Additional Antenna Improvements to increase coverage or meet Rev G Class III Requirements for Public Safety
- Some sites have no Shelters, Grounding or HVAC
- Towers and Shelters fall under new Building Code Regulations before changes can be made for Structure, Grounding and Safety
- No Digital Backbone for Data or Future Radio Platforms
- Costly T-1 lines with no redundancy



Blair County Current System Cont'd



- RF Equipment will not support Digital Subscribers on Digital Networks or Future Data Needs
- Lack of Coverage in the Northeast and the Southwest end of the County
- Lack of Wide Area Coverage for many of the Public Safety Agencies



DEPARTMENT OF EMERGENCE

Shelter Inside View









- G.P.S. Timing No Longer Supported
- Quantars Analog Only

Rack View







MUX

Equipment

- Tensor Banks
- All Analog Interface
- Costly T-1 line
 expense per month
- No IP Network in the County

Conventional Product Lifecycle



2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

QUANTAR station add-on

ASTRO-TAC receiver add-on

ASTRO TAC-3000

DIU

RNC

WNG

DIGITAC

SpectraTAC

TRAX GPS TIMING

Aftermarket Support Aftermarket Support Aftermarket Support **Aftermarket Support Aftermarket Support Aftermarket Support Aftermarket Support Aftermarket Support No Longer Supported**



^{*}Parts support to the best of Motorola's ability

WHAT IS REV G?



- Increased Wind Speed
- Increase Structure Class I, II, III
- Increased Ice Exposure and Terrain Exposure
- Increased Foundation Size and Grounding Requirements



WHAT IS P25?



- APCO & IMSA Developed Standard
- Project 25 CAPS Program
- Analog P25, Digital P25 Standards
- Standards Upgrade March 3, 2010
- Tracking Subscribers
- Exchange of Time Synch Data







Brush Site







Brush Antenna System



Brush County 911









Brush Foundation Brush Foundation Mods



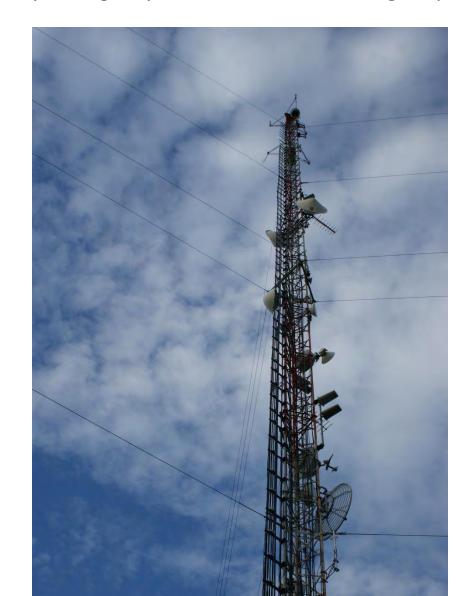




Brush County 911









Brush Lease







Wopsy I







Wopsy Combiner







Wopsy II (2)





Wopsy II Shelter









Wopsy II





Wopsy Master III





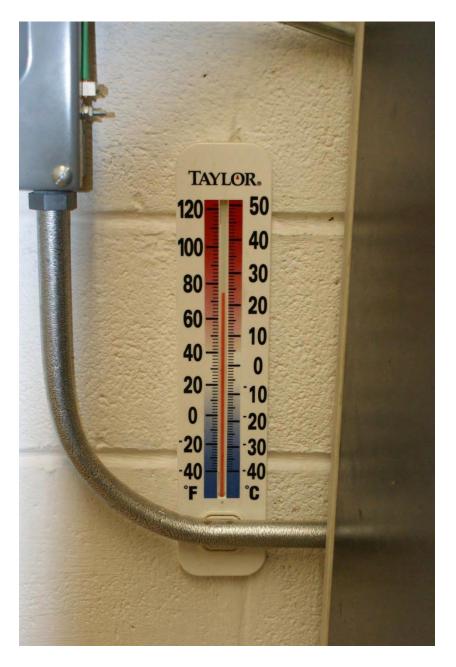




Wopsy Rack







Wopsy Temperature







Dunning Site







Dunning Antenna System





Dunning Shelter





Dunning Shelter











Dunning Tower Site





Dunning Tower Base







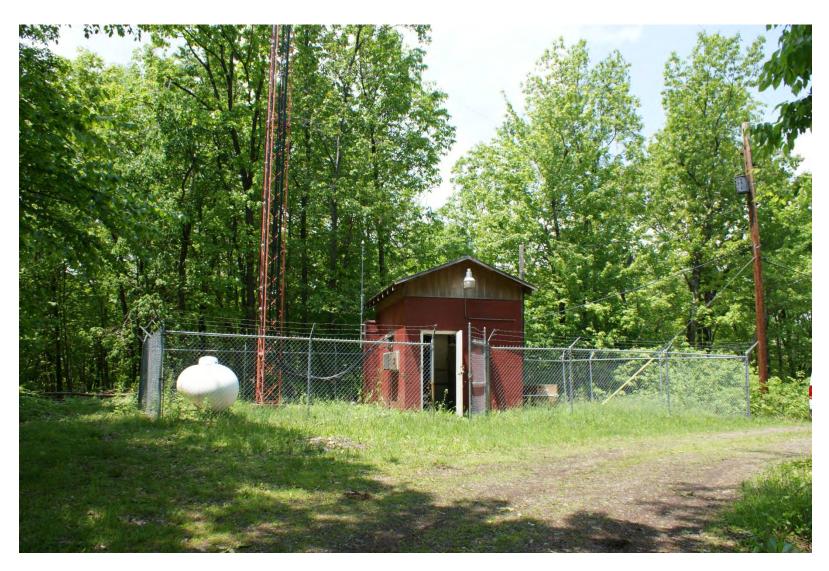


Tyrone Tower



DEP ASIMERGENCES OF EMERGENCES

Tyrone Tower









Tyrone Tower





Tyrone Tower





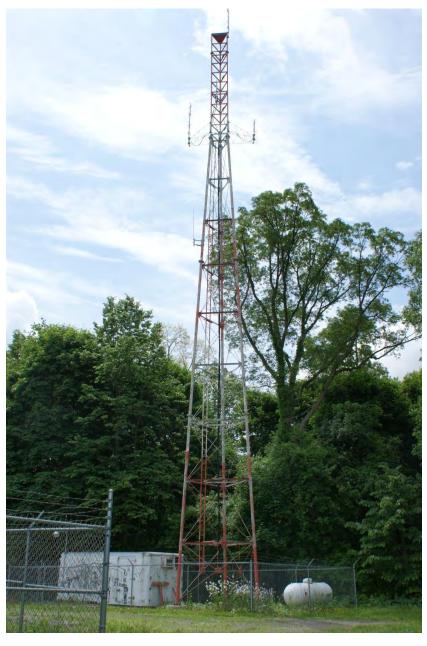


Tyrone Tower









Williamsburg East View







Williamsburg Entrance





Williamsburg Generator





DEPARTMENT OF EMERGENCE

Williamsburg Ladder Tray







Loop Mountain Co-Location





NARROWBANDING ALTERNATIVES



- 1. Go from 25 kHz analog to 12.5 kHz analog
- 2. Go to digital 12.5 kHz
- 3. Consider moving to another band





Digital Advantage

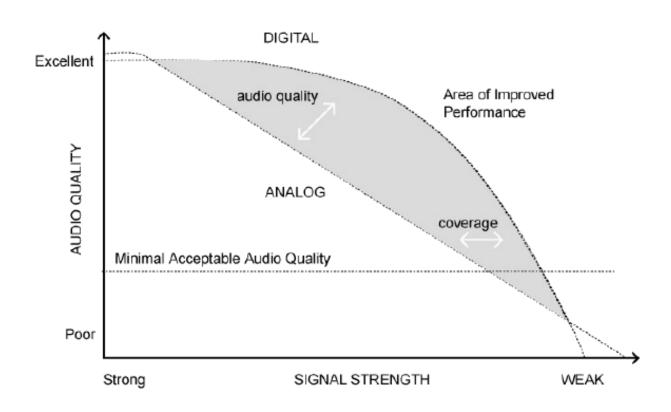
- Forward Error Correction in digital systems can help mitigate or buy back some lost coverage
- DAQ Delivered Audio Quality
- Digital signals can carry more than just voice
- Digital voice is more secure (can't be heard on a scanner) and is easily encrypted for even higher security



Digital Radio Technology



Digital Audio Coverage Enhanced Audio Performance





Digital Radio Technology



Digital Audio Coverage (Cont.)

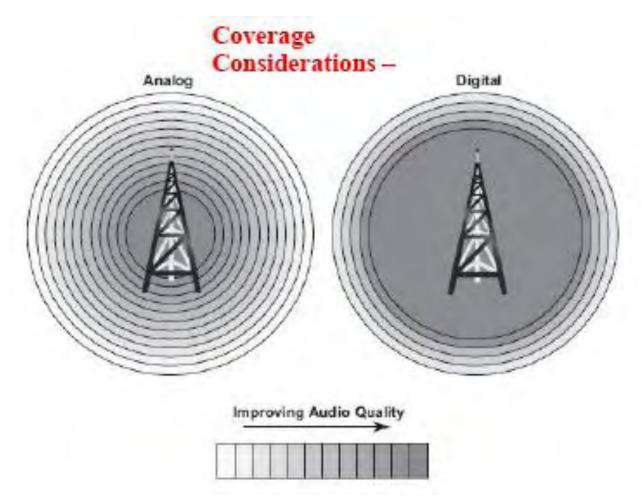
- What end user will experience with Digital Audio:
 - Consistent performance throughout coverage area with no gradual fade at the fringes
 - Digital sounds different
 - Background noise reduction
- ❖ What end user will NOT experience with Digital Audio:
 - Digital radio 'CD quality'
 - Digital cannot solve historic problems



Digital Radio Technology

DEPARTMENT OF EMERGENCY

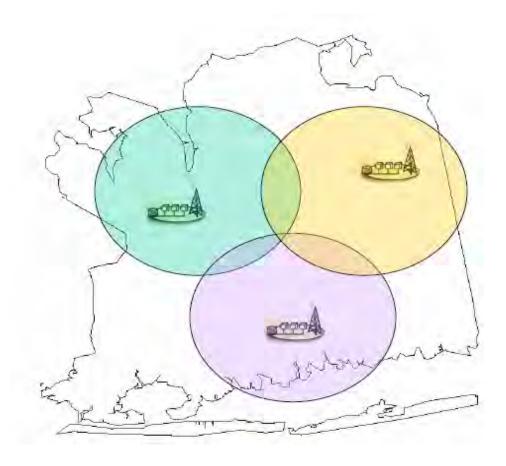
System Coverage Planning





Less Sites



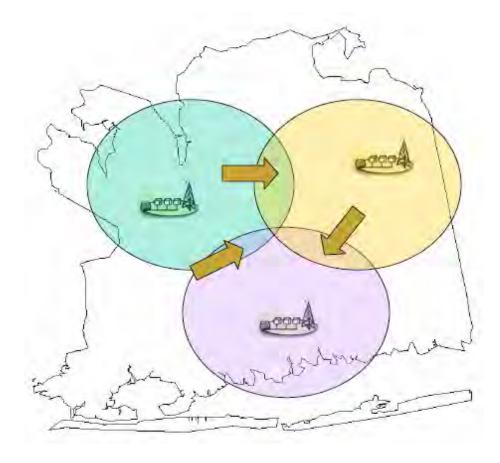


Tight synchronization keeps signals in phase



Better Coverage





Signals combine in overlap zones to improve coverage



Better Coverage



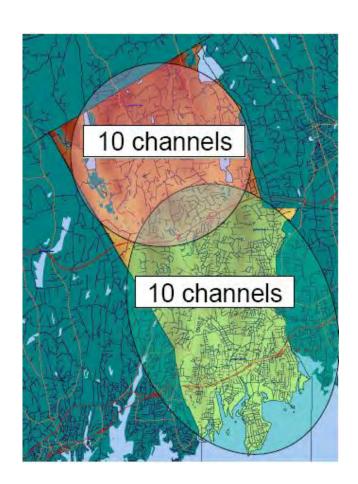


Overlap means better coverage for first responders



Full Capacity Everywhere



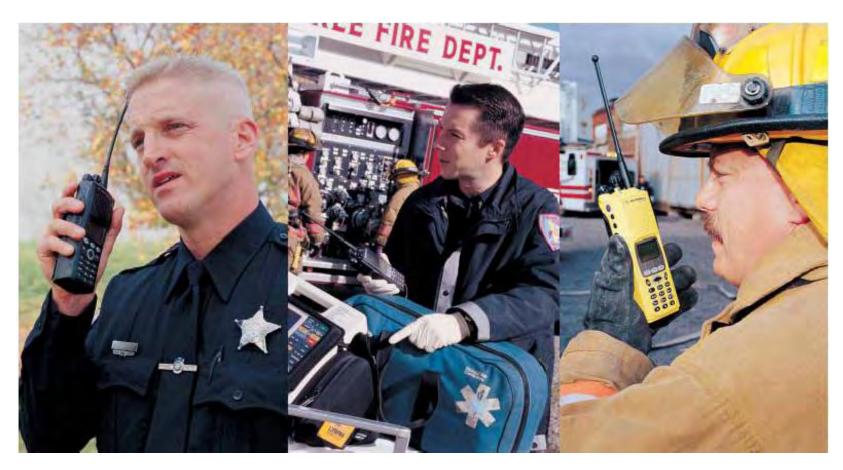


Simulcast gives you full capacity for emergencies



Multiple Sources for Subscribers



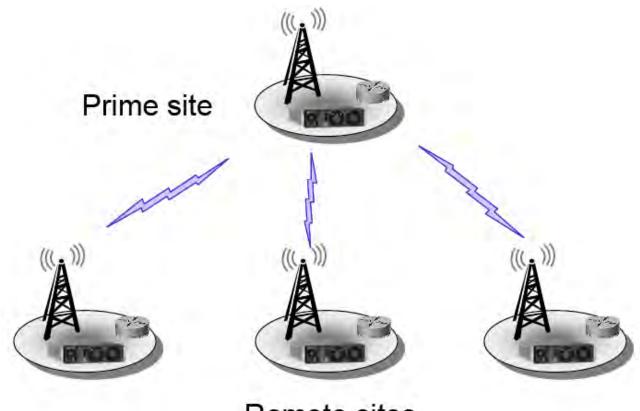


P25 simulcast is open architecture



Digital Simulcast Network





Remote sites

Microwave connectivity from prime site to remotes



Prime Site configuration





500 MHz stations

Comparators

Redundant prime site controller

GPS interface

Routers

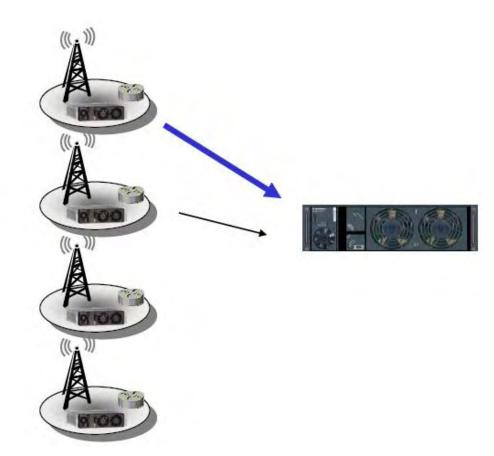
Prime site has RF, controllers, and comparators



Audio Processing







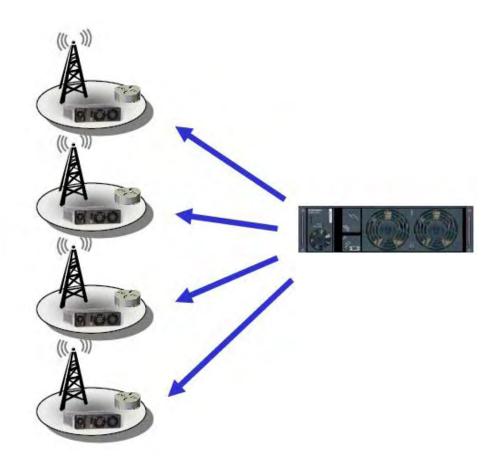
Comparator votes the strongest received signal



Audio Processing







Comparator routes audio to sites with appropriate delays



User Benefits





Clear audio, seamless roaming, and simple operation



Lower Total Cost of Ownership





Fewer sites because of additive overlap coverage



Lower Total Cost of Ownership



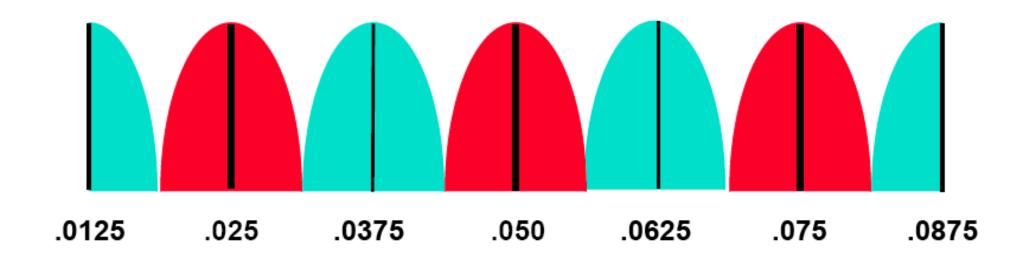


Compact stations mean smaller shelters



Linear Simulcast Modulation





Developed to increase site spacing with 12.5k Hz channels



C4FM Simulcast Modulation



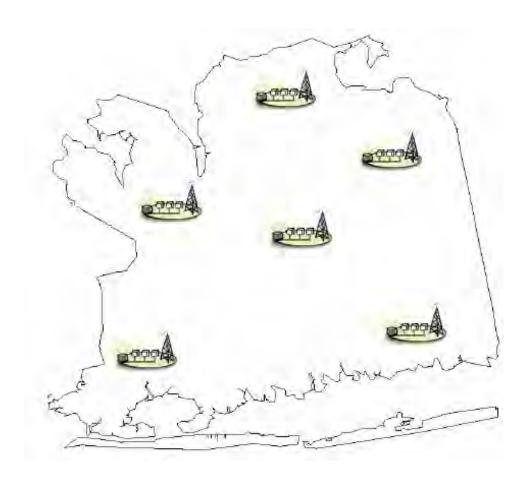


Non-linear site spacing is 8 miles maximum at 12.5 kHz



CQPSK Linear Simulcast Modulation





LSM means lower initial and ongoing costs



Linear Simulcast Modulation





You can buy radios from multiple manufacturers



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IP Simulcast



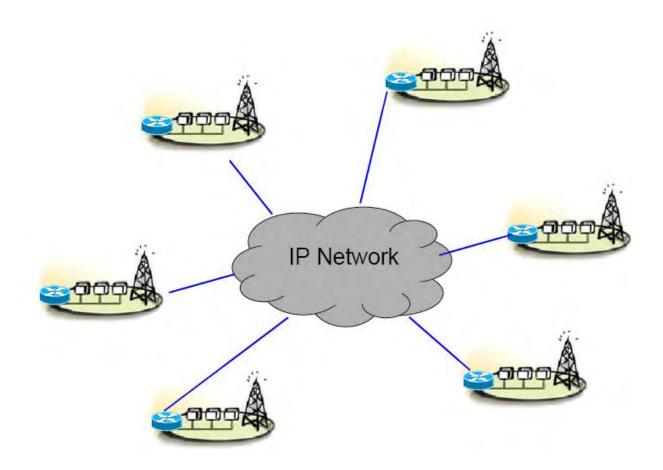


Channel banks are not required for IP simulcast



IP Simulcast





Channel banks are not required for IP simulcast



Traditional Microwave



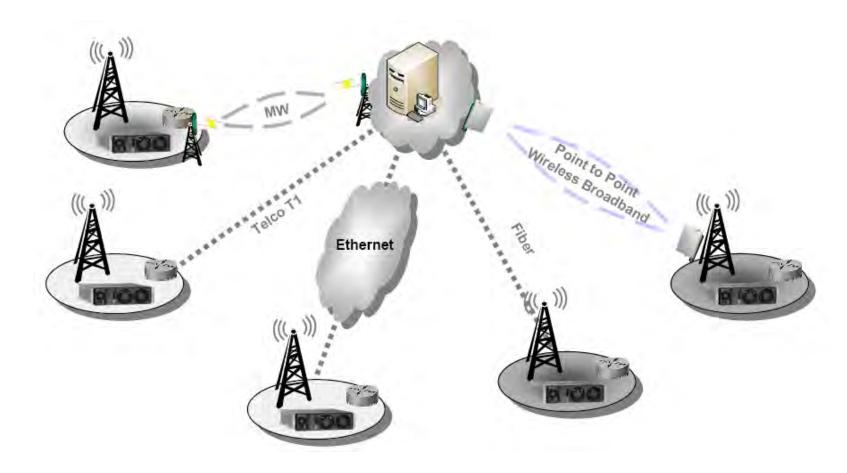


Traditional microwave has the lowest latency



Flexible backhaul Design





Many options available for simulcast backhaul





